

other appliances may yet enable us to prevent death altogether, is a question which can only be determined by a continuance of those experiments which led to the use of artificial respiration alone. But however valuable such a method as this may occasionally be in saving the lives of English officers, government officials, or persons living within reach of skilled assistance, and who might otherwise be doomed to certain death from the bite of a cobra, it is obvious that it is too complicated to be of much service to the numerous natives who are bitten in localities where no other assistance can be had than that of their comrades, equally ignorant with themselves. If any great diminution is to be effected in the frightful mortality annually resulting from the bites of venomous snakes in India, the remedies must either be so simple and easy of application that they can be used by the most ignorant, or the snakes must be destroyed. The best instructions yet given for the treatment of persons bitten by poisonous snakes are contained in Sir Joseph Fayrer's magnificent work on "The Thanatophidia of India." He recommends that a tight ligature be applied to the limb above the bite, that the bitten part be cut out as quickly as possible, and that the wound thus left be cauterised with a hot coal or hot iron, or touched with nitric or carbolic acid, while brandy or ammonia should be administered internally. Even this treatment, simple though it be, requires knowledge, as well as instruments and skill, which the majority of the natives do not possess. Sir Joseph Fayrer therefore recommends that in every police station and public place plain directions should be printed and hung up, and that at all such places a supply of whipcord, a small knife, a cautery iron, and a bottle of carbolic or nitric acid should be kept, as well as a supply of liquor ammonia for internal administration. But, as Sir Joseph Fayrer says, although comparatively little is to be expected even from this rational mode of treatment, much may be anticipated from prevention, and it is to be effected by making known the nature and appearance of the venomous as distinct from the innocent snakes, and by offering rewards (to be judiciously distributed) for the destruction of the former. The differences between many of the non-venomous and the venomous snakes are not known to the natives, and it is important that a knowledge of such distinctions should be widely disseminated, not only that the venomous ones may be more easily recognised, and thus avoided or destroyed, but in order to prevent death or serious illness from sheer fright, which may frequently result from the bite of a non-venomous species. For this purpose it would be well if the pictures of the chief venomous snakes contained in Sir Joseph Fayrer's work, or cheaper but accurate lithographic copies of them, were displayed in every police station and public place throughout India. Rewards should be paid for the destruction of venomous snakes only, and if these pictures were exhibited in the way suggested there would be little or no excuse for any mistake, either on the part of the natives who killed the snakes, or the officers whose duty it would be to pay the reward. As to the amount of reward, and its mode of distribution, there should, he suggests, be a department, or branch of a department, with a responsible chief and subordinate agents, for whom certain rules should be laid down, to be observed steadily

and without hindrance throughout the country, leaving much, as to detail, to the discretion of local authorities. If the destruction of venomous snakes and wild animals in India were intrusted to an officer such as controls the Thuggie and Dacoitee department, he considers that the result would in a few years be as good in the case of noxious animals as it has been in that of noxious men, Thugs and Dacoits.

THE BEETLES OF ST. HELENA

Coleoptera Sanctæ-Helenæ. By T. Vernon Wollaston, M.A., F.L.S. 8vo, pp. i.-xxv., 1-256, coloured plate. (London: Van Voorst, 1877.)

THIS, the last of its lamented author's valuable descriptive works on the geographical distribution of beetles (in personally collecting the material for which, it is to be feared that his physical exertions during a weak state of health induced the attack that ended recently in his death), must have been the most satisfactory to him, on account of the complete isolation of its subject, and his discovery of its most striking endemic fauna. The investigation of the *Coleoptera* of the Madeiras, Salvages, Canaries, and Cape-de-Verdes, with which his name will always be associated, had already resulted in a firm opinion that their peculiar beetle-types could not be satisfactorily referred to any geographical area now existing, but rather to some submerged Atlantic region, of which these groups are the modern representatives; and the results of his exhaustive work at St. Helena cannot have failed to materially strengthen this idea. Curiously enough, also, the most dominant type in this island is one to which Wollaston was always specially devoted, viz., the *Cossonidae*, a little known family of weevils, whereof the inordinately numerous species here found, consisting of variations of some half-dozen forms occasionally developed to so marvellous an extent as to be almost ludicrous, amply justified his expression (*in litt.*) that he had "tumbled on his legs in this little oceanic preserve of the southern Atlantic."

To any one interested in the faunæ of islands, no better conditions could be afforded than those found in St. Helena. Its vast distance from the nearest continents (nearly 1,200 miles from Africa, and 1,800 from South America) and, indeed, from the nearest island (Ascension, 700 miles), added to its complete severance by a fathomless depth at a mile and a half from its present coast-line, are premises of themselves suggesting the probability of abnormal resident forms; and the peculiar and very dense original vegetation of ebony, redwood, boxwood, *Psidium*, asters, gumwood, cabbage-palms, tree-ferns, &c., would reasonably be expected to foster a development of special wood-feeding types, to the partial or entire exclusion of other groups. This development, anticipated by Wollaston from the eccentric species received in former years, is wonderfully illustrated by an analysis of the present work. In it, 203 species are recorded, and may probably be taken as very nearly exhausting the fauna, since the author captured, mounted, and examined (with a delicacy, precision, and care peculiar to himself) no less than 10,000 specimens. Of the difficulty attending the collection of such a mass in six months, the author affords an indication by his remark

(*Entomologists' Monthly Magazine*, xii. p. 252) that the net may be used over miles of grassy mountain-slopes without finding a single flower-frequenter, or anything approaching to it. Under these conditions, it is not to be wondered at that Mr. Melliss's account of the island, not long ago reviewed in NATURE, should, as not representing the work of an expert, have failed adequately to represent its peculiar coleopterous features. Of the 203 species above mentioned, fifty-seven have undoubtedly been conveyed to the island through various external media, and have since established themselves—many of them, indeed, being the regular followers of civilisation. Seventeen of the remainder possess doubtful claims to be considered indigenous, or even to have been taken in St. Helena at all. Of the 129 species left, and which may be safely deemed endemic, the distribution is highly eccentric. Whole groups, hitherto regarded as well-nigh cosmopolitan, are either entirely absent or barely represented; and one section, the weevils, is most unduly exaggerated, especially in one of its families. The missing divisions are water-beetles (both *Hydradephaga* and *Philhydrida*—the aquatic *Carnivora* and *Herbivora*), and *Longicornia*; and their absence is the more noteworthy, as proper natural conditions exist for both of them; and, as to the latter, other wood-feeders have inordinately increased and multiplied. The *Necrophaga* (a wide term, covering many families of universal distribution, including bone-, skin-, and fungus-feeders, acting as natural scavengers, and whereof we have, even in Great Britain alone, over 450 species) and *Trichopterygia* have each but a single representative. The *Pseudotrimeria* (*Coccinellide*, &c.) and *Lamellicornia* can each only supply two. As to the former of these groups, Prof. Westwood has well observed that the inference is a want of *Aphides* and other plant-lice, on which lady-birds are the natural parasites; and on this point it would be interesting to know if the usual Homopterous vegetable-feeders are really wanting. If not indigenous they might be readily introduced; and, enumerating even the avowedly introduced *Pseudotrimeria* in Mr. Wollaston's list, we find only four species to keep them down, since the *Corylophide* and *Erotylide* included in the group by the author cannot be reckoned. As to the *Lamellicornia*, the want of indigenous mammals would readily account for the absence of such of them as feed on the excreta of those animals (*two* only, both introduced, can be found; here Baron von Harold would assuredly perish of inanition!); but the mighty tropical clan, revelling in rotten wood, should surely in such a latitude, with the decaying forests of centuries for pabulum, have reared more than the miserable tale of four, whereof but two are autochthones! Next in number come the *Priocerata* and *Phytophaga*, respectively counting but three. The *Elateride* and *Anobiide*, essentially wood-feeders, are the only families of the first of these that provide indigenous species: how they have failed to produce more is incomprehensible. The fact of plant-feeding beetles being of the greatest scarcity has been already quoted from the author himself, and is equally unintelligible. The *Staphylinide* and *Heteromera* each supply six indigenous forms, the paucity of the latter being perhaps accounted for by the lack of those sandy wastes peculiarly affected by so many of its members. Next in importance come

the *Geodephaga*, or land carnivorous beetles, whereof as many as fourteen (in fact all but one, and of them no less than eleven here described as new) are recorded. Here, again, the peculiarity of the island is emphasised, as the eleven new species, all of the genus *Bembidium*, depart widely from the shingle-, mud-, and marsh-frequenting habits of that vast and widely distributed genus, occurring as they do in the high central mountain ridges, and living inside the fibrous stems of rotten tree-ferns, an unexpected habitat as strange as that recorded in the Horatian lines:—

“Piscium et summa genus hæsit ulmo,
Nota quæ sedes fuerat columbis.”

These arboreal Bembids have necessitated the creation of three new sub-genera, distinguished by abnormally minute eyes, want of wings, rounded outline, fossorial legs, and moniliform antennæ; and would alone have been sufficient to have stamped the fauna as *sui generis*.

Last, and most important, come the *Rhynchophora* or weevils, with no less than ninety-one representatives, more than two-thirds of the whole number. These again are represented in unusual proportions, the *Cossonide* numbering fifty-four, two-fifths of the entire fauna (we have in England but nine, out of 3,000 species), and the *Anthribide* twenty-six. The conclusion derived by the author is, that, as these weevils unquestionably represent the dominant autochthonous family, and all (but one) are of lignivorous habits, St. Helena may be pictured in the remote past as a densely-wooded island, in which they performed their natural functions of tree-destroyers among tree-ferns and *Compositæ* on a gigantic scale, unaided by the usual timber-eaters. The well-nigh complete destruction of indigenous trees in modern times has no doubt been accompanied by the loss of many a link in the aboriginal chain of these peculiar forms. Those that still survive are of such eccentric structure and facies that the creation of eleven new genera and forty new species has been necessitated for their reception in the present work, which, had it been the sole production of its author, would have effectually prevented his name from passing into oblivion.

E. C. RYE

LETTERS TO THE EDITOR

- [The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]
- [The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

Oxygen in the Sun

ATTENTION having recently been directed by Dr. Schuster and Mr. Meldola, in connection with my discovery of oxygen in the sun, to the location of the oxygen, it may be of interest to allude to some experiments to determine the question by direct observation of the image of the sun spectroscopically. For this purpose I used a spectroscope furnished with a very fine grating on silvered glass given to me by Mr. Rutherford. This grating of 17,280 lines to the inch can be arranged to give a dispersion equal to twenty heavy flint glass prisms. The spectroscope was attached to my 12-inch Clark refractor, and I employed the full aperture of this telescope to produce an image of the sun on the slit. It did not seem practicable to use the spectroscope on the 28-inch Cassegrain reflector in this research, because the tremulousness of the air was usually too great, the image of the